ASSIGNMENT 3

Textbook Assignment: "Gas Cutting," pages 4-1 through 4-26.

Learning Objective: Recognize the relationship of oxidation to gas cutting.

3-1. What portion, if any, of a ferrous metal becomes oxidized during the oxygas cutting process?

1. The portiondirectly in the path of the cutting flame
2. The portion directly in the path of the oxygen jet
3. The portion previously cut
4. None

3-2. Metals that oxidize readily are best suited for oxygas cutting.

1. True
2. False

Learning Objective: Recognize the construction, operation, and care of the oxyacetylene and MAPP gas-cutting tips.

3-3. The principal difference between a standard cutting torch and an oxygas welding torch is that the cutting torch has an extra tube for high-pressure oxygen.

1. True
2. False

3-4. Unless the cutting torch tips and seats are properly designed and constructed, what type of problem can occur during their use?

1. Improper cooling
2. Improper gas flow
3. Leakage
4. All of the above

3-5. When cutting torch tips are not in use, you should take what action to keep them in proper working order?

1. Place them in kits
2. Store them in toolboxes
3. Store them in a container equipped with a wooden rack
4. Store them in a mount-out box

3-6. Of the following basic types of MAPP gas-cutting tips, which one is often used by a steelworker?

1. High pressure only
2. Standard pressure only
3. High pressure and normal cutting
4. Standard pressure and high cutting

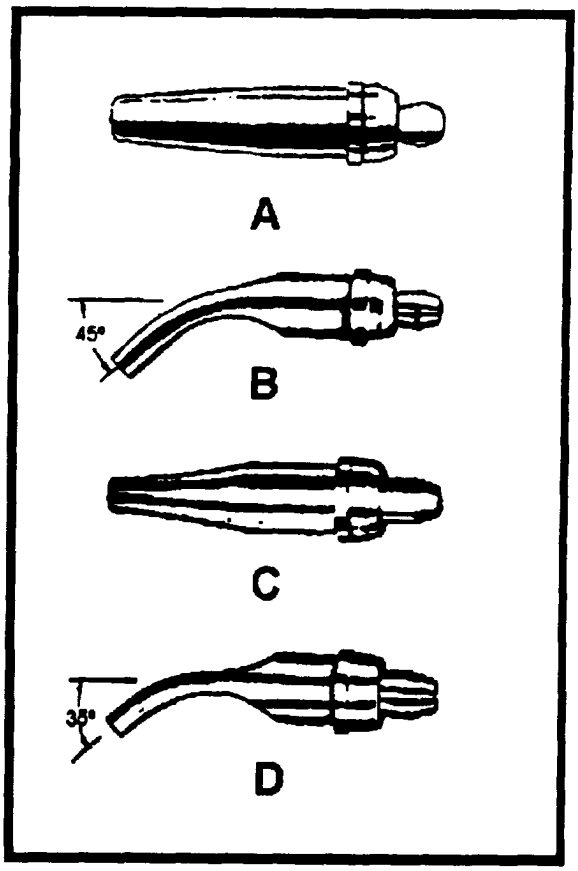

Figure 3A.—Cutting torch tips.

IN ANSWERING QUESTIONS 3-7 THROUGH 3-9, REFER TO FIGURE 3A.

3-7. What cutting torch tip is a MAPP gas one-piece tip?

1. A
2. B
3. C
4. D

3-8. What cutting torch tip is a MAPP gas two-piece tip?

1. A
2. B
3. C
4. D

3-9. Of the cutting torch tips shown, which one is a medium-preheat oxyacetylene tip?

1. A
2. B
3. C
4. D

3-10. The FS type of MAPP gas-cutting tip can be used for machine cutting.

1. True
2. False

3-11. What can you use as a tool to clean torch tip orifices when a tip cleaner is not available?

1. A nail
2. A welding rod
3. A soft cooper wire
4. A twist drill

3-12. When cleaning the orifices of a tip with a cleaner, you should push the cleaner straight into the orifices and pull it straight out without twisting.

1. True
2. False

3-13. You can correct slightly belled orifices by wearing down the end of the tip with which of the following tools?

1. A grinding tool
2. A wire brush
3. An emery cloth
4. A file

Learning Objective: Identify techniques of cutting, beveling, and piercing ferrous metals with an oxygas cutting torch.

3-14. Before starting to cut with a torch, you should inspect the working area and adjacent areas for combustibles that must be removed or covered to keep sparks or slag from igniting them.

1. True
2. False

IN ANSWERING QUESTIONS 3-15 AND 3-16, REFER TO TABLE 4-1 IN THE TEXTBOOK.

3-15. When the oxygen cutting pressure is set between 50 to 60 psi and a number 54 cutting tip is used, you can cut material that has what thickness?

1. 1 1/4 inches only
2. 2 inches only
3. 1 1/2 or 2 inches
4. 1 1/4 or 1 1/2 inches

3-16. What device is used to ignite a cutting torch?

1. A safety match
2. An open flame
3. A spark igniter
4. A butane lighter

3-17. Before low-carbon steel is cut, you should use what type of flame to preheat it?

1. Oxidizing
2. Neutral
3. Carburizing
4. Cyanizing

3-18. When using the cutting torch to preheat a low-carbon steel plate, you should keep what distance between the surfaces of the metal and the preheating flame?

1. 1/32 of an inch
2. 1/16 of an inch
3. 1/8 of an inch
4. 3/16 of an inch

3-19. When you have started a cut properly and the cut is going all the way through the material, the shower of sparks should fall in what manner?

1. Over both sides of the material
2. From the top of the material
3. Over one side of the material
4. From the bottom of the material

3-20. When you need to cut a round piece of metal stock with a cutting torch, you can save time by performing which of the following actions?

1. Using a one-piece standard pressure tip
2. Using a two-piece, fine spline, standard pressure tip
3. Chiseling a small burr at the starting point on the stock
4. Punching a small dent in the stock at the starting point

3-21. When starting a cut from the center of a meterial, you should take which of the following steps?

1. Preheat the starting area
2. Angle the torch approximately 45 degrees
3. Slowly open the cutting oxygen valve
4. Each of the above

3-22. Which of the following conditions can develop when you are cutting from the center of a material and do not use the proper procedures?

1. Spark blow-back
2. Clogged cutting tip orifices
3. Slag blows back on the cutting tip
4. Each of the above

3-23. When cutting metal plate with an oxygas torch, you can cause the top surfaces of the kerf to fuse if you make what error?

1. Using too much oxygen pressure
2. Advancing the torch too slowly
3. Holding the torch tip too close to the line of cut
4. Advancing the torch too rapidly

3-24. Moving the cutting torch too fast during the cutting process results in what effect on the material?

1. An incomplete cut
2. Slag buildup on the cutting side
3. Penetration by the cutting oxygen
4. Each of the above

3-25. What results when you cut thin steel by holding the torch vertical to the metal surfaces?

1. A smooth cutting action
2. An irregular cutting action
3. Accelerated flame penetration
4. Slow flame penetration

3-26. When, if ever, can you place your cutting torch almost vertical to the ‘surface for cutting?

1. Cutting steel that is less than 1/8-inch thick
2. Cutting pipe that is over 1/4-inch thick
3. Cutting steel that is over 1/8-inch thick
4. Never

3-27. When cutting steel greater than 1/8 of an inch in thickness, you should position the torch so the preheat flames are from 1.6mm to 3.2mm from the edge of the steel plate. You then hold the flame at this position until the steel becomes what color?

1. Bright red
2. Cherry red
3. Light red
4. Dark red

3-28. To start a cut quickly in thick plate, you should hold the cutting torch so it slants toward the direction of travel.

1. True
2. False

3-29. One way you can commence a starting cut is to place an iron filler rod at the edge of a thick metal plate and begin preheating it.

1. True
2. False

3-30. When cast iron is being cut, what is the preheating temperature?

1. 500°F
2. 200°F
3. 300°F
4. 400°F

3-31. By varying the speed of travel, the oxygen pressure, and the angle of a large orifice, and by using a low-velocity-jet cutting tip on the surface of a metal plate, you can accomplish which of the following tasks?

1. Create gouged contours
2. Beveling
3. Chamfering
4. Each of the above

3-32. In using a cutting torch, a Steelworker can end up with a deep, wide gouge on a metal plate by taking which of the following actions?

1. Applying too much cutting oxygen
2. Moving the torch too fast in the cut
3. Moving the torch too slow in the cut
4. Each of the above

3-33. The technique for cutting bevels on metal plates with an oxygas cutting torch differs from the technique for making straight cuts with the same torch in that the cutting of bevels requires the welder to use (a) what level of oxygen pressure and (b) what cutting speed?

1. (a) More (b) slower
2. (a) More (b) faster
3. (a) Less (b) slower
4. (a) Less (b) faster

3-34. A motor-driven cutting torch is adjusted up and down by means of what component(s)?

1. The handwheel only
2. The radial bar only
3. The reduction gear assembly and the handwheel
4. The gear and rack assembly

3-35. When using an electric drive carriage on a straight track, you can check the clearance of the torch before cutting by performing which of the following actions?

1. Releasing the clutch and pushing the carriage an arms length in either direction on the track
2. Releasing the clutch and freewheeling the carriage the full length of the track by hand
3. Releasing the clutch, opening the oxygen torch valve, and measuring the flame distance between the torch and material
4. Turning on the current and making a dry pass with the torch

3-36. After the desired cut with the motor-driven cutting torch is completed, you should secure the machine in what sequence?

1. By extinguishing the flame, turning off the cutting oxygen, and then turning off the electric current
2. By turning off the cutting oxygen, extinguishing the flame, and then turning off the electric current
3. By turning off the cutting oxygen, turning off the electric current, and then extinguishing the flame
4. There is no specific sequence to follow

3-37. To obtain a smooth bevel on heavy pipe with an oxygas cutting torch, an inexperienced operator should perform which of the following actions?

1. Cut the pipe off square, then cut the bevel
2. Cut the pipe off square, then cut the bevel with a bench grinder
3. Use a small cutting tip, one that is easy to manipulate
4. Use a length of angle iron to guide the torch along the line of cut

3-38. When cutting a pipe, you should keep the torch at a 45-degree angle and cut from bottom up to the top.

1. True
2. False

3-39. When fabricating a T-fitting from pipe, what condition develops if you do not cut out the punch marks used to mark an outline?

1. Slag buildup
2. Enlarged kerf
3. Irregular bevel
4. Cracking

IN ANSWERING QUESTIONS 3-40 AND 3-41, REFER TO FIGURE 4-28 IN THE TEXTBOOK.

3-40. Which of the following steps shows the procedure for cutting the miter on the branch of the pipe?

1. Step 1, part B
2. Step 2, part A
3. Step 3, part A
4. Step 1, part C

3-41. Which of the following steps shows the completed cut for the run?

1. Step 1, part C
2. Step 2, part B
3. Step 3, part A
4. Step 5, part B

3-42. When using the cutting torch to pierce holes in a steel plate, you should hold the preheating flame above the surface of the plate at what distance relative to the preheating cones and the metal surfaces?

1. The inner preheating cones contact the metal surface
2. The outer preheating cones are about 1/16 inch above the metal surfaces
3. The inner preheating cones are about 1/8 inch above the metal surface
4. The inner preheating cones are about 1/4 inch above the metal surface

3-43. When removing a rivet from a plate with a cutting torch, you should take what procedural step just before slicing off a portion of the head?

1. Heat the entire rivet and surrounding plate to cutting temperature
2. Change the torch tip from preheating to cutting
3. Remove the layer of scale between the rivet head and the plate
4. Cut a slot in the rivet head

3-44. The cutting tip best suited for cutting buttonhead rivets and removing countersunk rivets has a large diameter cutting oxygen orifice and is referred to as what type of cutting tip?

1. Low velocity
2. High velocity
3. Fast cut
4. Low speed

3-45. When cutting wire rope with a torch, you can prevent the strands of rope from unlaying by performing what action?

1. Clamping the wire rope with c-clamps on each side where the cut is to be made
2. Wrapping the wire rope with seizing wire on each side where the cut is to be made
3. Placing the wire rope in a riggers vise
4. Heating the ends of the wire rope until the strands fuse together

3-46. Before cutting a wire rope with an oxygas cutting torch, you should take what action?

1. Remove excess lubricant
2. Remove the outer layer of strands
3. Coat the rope with a special flux material in the area to be cut
4. Fuse the ends of the strands to prevent unlaying of the wire rope

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Learning Objective: Identify special oxygas cutting techniques.

3-47. Which of the following metals can be cut with the oxygas cutting torch and fluxes?

1. Cast iron
2. Alloy steel
3. 1 percent carbon steel
4. Each of the above

3-48. When a cutting operation takes place, you can take what action to reduce distortion and prevent hardness of surfaces?

1. Clamp the metal in a vise
2. Apply a steady flow of high-pressure oxygen before, during, and after the cutting period
3. Preheat the metal before starting the cut
4. Insert iron or low-carbon steel into the area being cut

3-49. To preheat cast iron before cutting with the oxygas cutting torch, you should use what type of flame?

1. A strong carburizing flame
2. A weak carburizing flame
3. A neutral flame
4. An oxidizing flame

3-50. To make alloy metals easier to cut, you can add what type of metal(s) to their cutting areas?

1. Iron only
2. Low-carbon steel only
3. Iron and low-carbon steel
4. Thin cast iron and pig iron

3-51. A reciprocating torch movement is used to cut which of the following metals?

1. Copper
2. Thick cast iron
3. Stainless steel
4. Thin cast iron

3-52. When stainless steel is being cut with an oxygas cutting torch, how does the use of flux make the cutting easier?

1. Flux reacts chemically with stainless steel to lower the melting point of steel
2. Flux reacts chemically with oxides to form a slag having a melting point lower than that of stainless steel
3. Flux generates heat to increase the temperature of the flame above the melting point of stainless steel
4. On melting, flux counteracts the effect that oxides have on stainless steel

3-53. Of the following characteristics, which indicates a good cutting job with an oxygas torch?

1. Smooth at the sides
2. Sharp and square at the top
3. Free of Slag
4. Each of the above

3-54. Which of the following character-istics of a drag line indicates proper cutting procedures were followed?

1. Long and irregular
2. Long and vertical
3. Short and vertical
4. Short and irregular

3-55. What is the minimum distance permitted between unprotected combustibles and oxygas cutting equipment that is being used?

1. 10 feet
2. 20 feet
3. 30 feet
4. 40 feet

3-56. During the operation of an oxygas cuttinng torch, a backfire can occur under which of the following circumstances?

1. Overheating of the cutting tip
2. Dirt on the tip seat
3. Incorrect gas pressure
4. Each of the above

3-57. When you have a flashback with an oxygas cutting torch, what action, if any, should you take to stop it safely?

1. Close off the gas value first
2. Close off the oxygen valve first
3. Close off both valves simultaneously
4. None

3-58. What component(s) of an oxygas cutting torch unit is/are usually responsible for a flashback?

1. Loose tip or head
2. Clogged valves only
3. Clogged orifices only
4. Clogged valves and orifices

3-59. When, if ever, should you weld or cut a container that once held a flammable substance?

1. After cleaning
2. After filling with water
3. After cleaning and filling with water
4. Never

3-60. During the welding or cutting operation, what percentage of air space inside a water-filled container does nitrogen occupy?

1. 80 percent
2. 60 percent
3. 50 percent
4. 40 percent

3-61. When doing any hot work on water-filled tanks or containers, you should take what additional safety precaution?

1. Vent them
2. Stem them
3. Wash them chemically
4. Seal them